

SECTION 02620**MANHOLE FRAME SEALING SYSTEM****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. This section includes the materials and procedures required to seal the interior frame joint area and the chimney above the cone of a manhole. It is emphasized that the purpose of the manhole frame sealing system is for corrosion protection.
- B. Only manholes which are considered or known to be subject to sewer gas corrosion will be required to have a manhole frame sealing system. A listing of manholes requiring liners and frame sealing systems is provided in Section 02536. These manholes shall have the interior surfaces of the barrel and cone protected by T-Loc by Ameron, AGRU "Suregrip" or approved equal liners or be constructed with concrete containing Con^{mic}Shield and be equipped with a frame sealing system. Unless otherwise specifically called out no other manholes will require the frame sealing system or liner.

1.02 DEFINITIONS

- A. Chimney: The cylindrical variable height portion of the manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the cone to the base of the manhole frame.
- B. Cone: The portion of the manhole structure which slopes upward and inward from the barrel of the manhole to the required chimney or frame diameter.

1.03 SUBMITALS

- A. Submit notarized certification from the frame seal manufacturer stating that the proposed product meets the design life, performance and applicable material requirements of this specification.

1.04 QUALITY ASSURANCE

- A. Manhole frame seals shall be tested for water tightness and visually inspected after installation to insure that the seal is properly positioned, tight against the manhole and frame surfaces, that no void or leakage points exist and that the bands are locked securely locked in place. Seals failing this test shall be reworked as necessary and retested.
- B. Any seals not passing visual inspections may, at the Contractor's option, be tested for leakage using a method approved by the Department.

PART 2 - PRODUCTS**2.01 FRAME SEAL**

- A. General: Manhole frame-chimney seals shall remain flexible throughout a 25 year design life, allowing repeated vertical movement of the frame of up to 2 inches and/or repeated horizontal movement of up to 1/2 inch. Seal shall consist of a flexible internal rubber sleeve and extension and stainless steel expansion bands as manufactured by Cretex Specialty Products or approved equal.
- B. Sleeve and Extension: The sleeve portion of the seal shall be either double or triple pleated with a minimum unexpanded vertical height of 8 inches or 10 inches respectively. The sleeve and extensions shall have a minimum thickness of 3/16 inches and shall be made from a high quality rubber compound conforming to the applicable requirements of ASTM C-923, with a minimum 1500 psi tensile strength, a maximum 18% compression set and a hardness (Durometer) of 48+5.
- C. Expansion Bands: The expansion bands used to compress the sleeve against the manhole shall be integrally formed from 16 gauge stainless steel conforming to ASTM A-240, Type 316, with no welded attachments and shall have a minimum width of 1-3/4 inches. The bands shall have a minimum adjustment range of 2 diameter inches and the mechanism used to expand the band shall have the capacity to develop the pressures necessary to make a watertight seal. The band shall be permanently held in this expanded position with a positive locking mechanism. Any screws, bolts or nuts used for this mechanism shall be Type 316 stainless steel.

PART 3 - EXECUTION

3.01 INSTALLATION - NEW CONSTRUCTION

- A. All sealing surfaces shall be reasonably smooth, clean and free of any form offsets or excessive honeycombs.
- B. The top internal portions of the cone shall have a minimum 3-inch high vertical surface. The preparation of this vertical surface shall be in accordance with the frame seal manufacturer's instructions.
- C. The internal frame seal and extensions shall be installed in accordance with the manufacturer's instructions.

3.02 REHABILITATION - EXISTING CONSTRUCTION

- A. General
 - 1. When frame sealing is required on brick or block manholes, an internal flexible rubber frame seal, as specified above, shall be used to seal the frame joint area and the chimney above the cone of the manhole.
 - 2. When frame sealing is required on precast manholes, an internal flexible rubber frame seal and where necessary, an interlocking extension or extensions, as specified above, shall be used to seal the entire frame joint area and the chimney above the cone of the manhole. The seal and extension or extensions shall extend from the frame

down to the top of the cone. No gap shall be left between the cone liner and the frame seal.

- A. All loose and protruding mortar and brick that would interfere with the seal's performance shall be removed and the appropriate areas of the manhole frame, chimney and or cone/corbel cleaned by wire brushing. All sealing surfaces shall be reasonably smooth and circular, clean and free of any loose material or excessive voids.
- B. Repair mortar shall be used to prepare a uniformly vertical 3"-4" wide surface for the sleeve and extensions to seal against, if an adequate surface does not exist or if required by the Department. Repair mortar shall be a one component, quick set, high strength, non-shrink, polymer modified cementitious patching mortar, which has been formulated for vertical or overhead use. It shall not contain any chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents nor shall it promote the corrosion of any steel that it may come in contact with.
- C. Detail surface preparation, including providing a vertical surface on a cone when none exists, shall be in accordance with the frame seal manufacturer's instructions.
- D. All manhole frames that are misaligned from the frame joint area to the chimney above the cone by 3-inches or more, or if required by the Department, shall be excavated and realigned. All existing frames shall be thoroughly cleaned before reinstallation. The frames shall be set in a bed of cementitious grout mixed to a mortar consistency. Cementitious grout shall be a premixed, non-metallic, high strength, non-shrink grout which meets the requirements of ASTM C-191 and C-827 as well as CRD-C588 and C621. When mixed to a mortar or "plastic" consistency, it shall have minimum one day and 28 day compressive strength of 6,000 and 9,000 psi, respectively.
 - 1. Realignment of manhole frames in paved areas shall include saw cutting, pavement removal, disposal and replacement, excavation, backfill and the cleaning and reinstallation of the existing frame.
 - 2. Realignment of manholes in unpaved areas shall include excavation, cleaning and reinstallation of the frame, backfill and surface restoration.
- E. Manhole frame shall be set so that the tops of the covers are flush with the adjoining pavement or ground surface.
- F. The internal frame seals and extensions shall be installed in accordance with the manufacturer's instructions.

- END OF SECTION -